



Session	Start-ups/SMEs looking for Finance: Pre-seed/Angel/Seed
Title	Cofactor mimics: making oxidoreductase biocatalysis cheaper, simpler and scalable
Company	Tulip Enzyme Solutions
Speaker	Allison Wolder
TRL	TRL 1-3
Keywords feedstock (max 2)	Terpene substrates
Keywords technology (max 2)	Cofactor mimics
Keywords End-Product (max 2)	Fragrance ingredients
Abstract:	
Oxidoreductases offer the selective chemistry fine chemical producers need, but most rely on the natural cofactor NAD(P)H, which is expensive, unstable and hard to recycle. As a result, many enzymatic routes never reach production, and producers stay dependent on metal catalysts with volatile prices and concentrated supply. Tulip Enzyme Solutions (TulipES) has developed synthetic nicotinamide cofactor mimics and a matching recycling enzyme that replace the natural cofactor. The mimics are more stable and a fraction of the cost, which can make cofactor-dependent enzymes easier to use and affordable at scale. Our first PCT patent application is filed and a second, covering a novel process, is being drafted. The founders combine PhDs in biocatalysis and biotechnology with industry and R&D experience, advised by Dr. Caroline Paul (TU Delft), a leading expert in cofactor biomimetics. Our beachhead is flavour and fragrance, where demand for selective, sustainable scent molecules is growing. Following lab-scale proof of concept, we are validating the platform on (R)-citronellal, a key fragrance ingredient and menthol precursor today made mainly with precious-metal catalysts. The need is backed by 48 interviews in 12 countries with F&F producers, enzyme developers and catalyst suppliers. At Pitch Perfect we seek F&F producers to co-develop a pilot on (R)-citronellal or a chiral target of their choice, and investors for our €500k seed round.	